

**REMARKS**

Upon entry of the present Reply, claims 1, 3, 5-7, 16, 17, 22-27, 29-34, 37, 39, 41-52 and 57-65 are pending in the present application.

Claims 4, 11, 28 and 56 were previously cancelled.

Claims 2, 8-10, 12-15, 18-21, 35, 36, 48, 40 and 53-55 are cancelled herein.

New claims 60-65 are added herein. Support for new claims 60-62 may be found, for example, at [0038] of the application as filed. Support for new claims 63-65 may be found, for example, at [0034] of the application as filed.

Claims 1, 3, 5, 23, 27, 30, 37, 39 and 43 are amended herein.

Support for the amendments may be found in the application as filed. Support for the amendment of claims 1, 27 and 43 to include the 70 wt.% feature may be found, for example, in the specification at p. 9 in [0038]. Claims 3, 5, 16, 37 and 39 are amended to correspond to the cancellation of claim 2 and to comport with the amendment of claim 1 deleting structure (II). Claims 1, 23, 27 and 30 are amended in response to the Examiner's requirement based on the objection to "comprising" or "include"(which Applicants traverse, but accede to in advancing prosecution of the application).

Reconsideration of the application based on the presently pending claims is respectfully requested in view of the foregoing amendments and the following remarks.

**Substance of Telephonic Interview**

On 06 September 2006, a telephonic interview was had between Examiner Oh and Applicants' undersigned attorney. During the interview, the nature of ionic liquids was discussed, and the differences between ionic liquids as claimed and the compositions of the prior art, were discussed. Various possible amendments of the claims were discussed. The submission of a Declaration under 37 CFR 1.132 was discussed. No agreement was reached with respect to amendment of the claims or to the content of a possible Declaration.

This constitutes Applicants' statement of the substance of the interview.

**Rejections under 35 U.S.C. §112, Second Paragraph**

Claims 16, 17, 20, 21, 43, 50, and 52-53 stand rejected as indefinite for a variety of reasons. Applicants respectfully traverse all of these rejections.

Regarding claims 1, 23, 27 and 30, as noted above, the claims have been amended to address the alleged indefiniteness.

Regarding the term "hydrocarbon" in claims 16, 17 and 50, it would appear that the Examiner failed to consider Applicants' arguments regarding this term. Applicants again respectfully decline to amend these claims, for the same reasons set forth in the previous Reply and repeated here. Applicants respectfully submit that there is no indefiniteness and that any person of ordinary skill in the art would readily understand what is claimed.

The term "hydrocarbon" is well known and well understood in organic chemistry, and no person of ordinary skill in the art would find anything indefinite about the use of this term. As is well known, a hydrocarbon is a compound consisting of carbon and hydrogen. The Examiner is respectfully reminded that a patent application is directed to those of skill in the art and need not describe every minute detail of aspects of the invention that are within the skill of the skilled person.

The Federal Circuit and its predecessor, the CCPA, have repeatedly explained that a patent applicant does not need to include in the specification that which is already known to and available to one of ordinary skill in the art. See, e.g., *Paperless Accounting, Inc. v. Bay Area Rapid Transit Sys.*, 804 F.2d 659, 664, 231 USPQ 649 (Fed. Cir. 1986); *In re Howarth*, 654 F.2d 103, 105, 210 USPQ 689 (CCPA 1981) ("An inventor need not, however, explain every detail since he is speaking to those skilled in the art."); *In re Lange*, 644 F.2d 856, 863, 209 USPQ 288 (CCPA 1981). The Court thus has noted that "[n]ot every last detail is to be described, else patent specifications would turn into production specifications, which they were never intended to be." *In re Gay*, 309 F.2d 769, 774, 135 USPQ 311 (CCPA 1962). Applicants respectfully submit that it is unnecessary to further specify the "hydrocarbon" and request the Examiner to withdraw this objection.

Applicants respectfully submit that all of the objections for indefiniteness have been addressed and overcome. For all the foregoing reasons, Applicants respectfully submit there is no indefiniteness under 35 USC 112, second paragraph, in the presently pending claims.

**Rejections under 35 U.S.C. §102(b)**

Applicants respectfully and gratefully acknowledge the withdrawal of the previously asserted rejection of claims as anticipated by the various references.

**Rejections under 35 U.S.C. §103(a)**

Claims 1-13, 16, 17, 20-35, 37, 39-42 and 56 stand rejected as unpatentable over Bratescu et al., US 6,306,805. Applicants respectfully traverse all of the rejections of all of these claims for at least the following reasons.

Bratescu et al. fails to disclose or even suggest an ionic liquid. Bratescu et al. discloses nothing more than a conventional combination of surfactants. There is nothing whatsoever in Bratescu et al. that would suggest how the disclosure could be modified to form an ionic liquid. Applicants respectfully submit that the presently claimed invention is not and would not have been obvious over Bratescu et al. There is simply no basis whatsoever for the contention that it would have been obvious from Bratescu et al. to have so modified it as to result in the presently claimed invention.

Applicants incorporate by reference all of the arguments against this rejection submitted in the Reply to Office action filed in March 2006, as if fully restated herein.

Furthermore, Applicants have amended the claims to specify that the ionic liquid compositions of claims 1, 27 and 43 contain greater than 70 % of the ionic liquid. There is nothing whatsoever in Bratescu et al. that would suggest any such modification.

The maximum of all the combined quaternary, anionic and bridging surfactants in Bratescu et al. is 40% by weight based on the total weight of the composition, col. 7, lines 10-15.

The maximum quaternary ammonium content is 5% by weight.

As noted by the Examiner in response to Applicants' arguments, "the meaning of the claimed ionic liquid, that is nothing more than the liquid containing equivalent amounts of the anion and cation". Thus, if the maximum quaternary ammonium content is 5 wt%, then the maximum of the anionic species can only be a stoichiometrically equivalent amount, and this cannot be as high as 70 percent of the composition, as claimed, and there is nothing in Bratescu et al. to suggest such an extreme modification. This is particularly so when it is considered that Bratescu et al. is directed to aqueous compositions for use as a shampoo or body wash. See, Declaration of Roger D. Moulton, at paragraphs (7)-(15), also discussed in more detail below.

There is simply no motivation or suggestion to modify this disclosure in a way that could lead to the claimed ionic liquid composition comprising greater than 70 percent of the ionic liquid. See, Declaration of Roger D. Moulton, at paragraphs (13)-(15), also discussed in more detail below.

Furthermore, the sulfosuccinate disclosed in Bratescu et al. is only one of a very large number of possible auxiliary anionic surfactants disclosed from col. 33, line 57 to col. 35, line 63. As noted at the beginning of the disclosure relating to the auxiliary anionic surfactant section, it is preferred that no such material be added. The disclosure states at col. 34, lines 45-47 that particularly preferred auxiliary anionics includes mixtures of  $C_8$  alkyl sulfate and alkyl ethoxysulfate surfactants. While the structures including one similar to the claimed structure (I) are shown at col. 35, lines 25-30, these are just two possible general structures out of the myriad surfactants disclosed from col. 33, line 57 to col. 35, line 63, and there is no statement that these are preferred. These are just two of the "laundry list" of possible auxiliary surfactants disclosed and there is nothing to particularly suggest these for selection for use, much less to suggest that they not only be selected, but that the explicit teachings of Bratescu et al. regarding the amounts of the surfactants be ignored and significantly modified, as would be necessary to reach the presently claimed invention. See, Declaration of Roger D. Moulton, at paragraphs (6) and (17), also discussed in more detail below.

Thus, Applicants respectfully submit that there is no basis for a contention that Bratescu et al. would have rendered obvious the claimed invention, or for a rejection of Applicants' claims based on such a contention.

Accordingly, Applicants request the Examiner to withdraw the rejection of these claims over Bratescu et al.

New claims 60-62 further distinguish over Bratescu et al., by specifying that the composition comprises greater than 80 weight percent of the ionic liquid. This concentration is even further from Bratescu et al., and would not have been obvious thereover for the same reasons set forth above, in addition to the higher concentration.

New claims 63-65 further distinguish over Bratescu et al., by specifying that the anion and the cation are present in stoichiometric amounts. This further distinguishes from Bratescu et al., which contains no suggestion whatsoever that any anion and cation should be present in stoichiometric equivalence, and would not have been obvious thereover for the same reasons set forth above, in addition to this further distinction.

For all the forgoing reasons, Applicants respectfully submit that there is simply no basis for the contention that Applicants' invention would have been obvious over Bratescu et al. The purpose and use of Bratescu et al. is completely different and, while the very large number of compounds and myriad possible combinations of such compounds disclosed by Bratescu et al. may include the compounds claimed, there is nothing whatsoever in Bratescu et al. to suggest or motivate, and there is actual teaching away from, increasing the concentration of the necessarily selected compounds to the levels claimed in the present application.

Accordingly, for all these reasons, and the additional reasons set forth in the Declaration discussed below, the rejections of the claims over Bratescu et al. should be withdrawn.

Claims 27, 28, 36 and 40 stand rejected as obvious over Quack et al. US 4,150,216. Applicants respectfully traverse all of the rejections of all of these claims for at least the following reasons.

Applicants have amended the claims to remove structure (II) which, if the rejection over Quack et al. is correctly understood, renders moot these rejections.

For the foregoing reasons, Applicants submit that the claimed subject matter as a whole would not have been obvious, that there is insufficient basis for a *prima facie* case of obviousness of the presently claimed invention, and that the presently pending claims are in condition for allowance. Notice to such effect is respectfully requested.

**Declaration Under 37 CFR 1.132**

Submitted herewith is a Declaration Under 37 CFR 1.132, by Dr. Roger Moulton, one of the inventors of the presently disclosed and claimed invention. As evidenced by the Declaration, Dr. Moulton is a person of skill in the art of ionic liquids. Appropriate consideration and deference to the Declaration is respectfully requested.

As attested in paragraph (5) of the Declaration, the composition disclosed by Bratescu et al. is an aqueous composition, and as attested in paragraphs (14)-(16), the composition disclosed by Bratescu et al. is intended to be used as an aqueous composition when diluted. The components of the composition must be water soluble. In contrast, as attested in paragraph (17), the presently claimed ionic liquids are intended for use in non-aqueous systems.

As attested in paragraphs (6) and (18) of the Declaration, the auxiliary anionic surfactants disclosed by Bratescu et al., which are optional ingredients, include a very large number of possible anionic surfactants, and in fact state that others are more preferred. Even of the sulfosuccinates disclosed at col. 35, lines 16-39, only some compositions of the two structures are similar to the claimed compound (I) in claims 1, 27 and 43. Regarding the sulfosuccinates, there is nothing to suggest that either of these structures are any more suitable or preferred than any other of the many auxiliary surfactants disclosed by Bratescu et al.

As attested in paragraph (7), even if one were to select the exact compounds of Bratescu et al. corresponding to the compounds in the claimed ionic liquid of the

present invention, one could not obtain an ionic liquid based on or beginning with the teachings of Bratescu et al.

As attested in paragraph (8) of the Declaration, as would be understood by the person of skill in the art, and as set forth in [0006] of the present application, an ionic liquid is a salt comprising a cation and an anion, in stoichiometrically balanced amounts, and is a liquid at or near ambient temperatures. There is nothing in Bratescu et al. to suggest that a stoichiometrically equivalent amount of the anion and cation should be used, as alleged by the Examiner to constitute an ionic liquid.

As shown by the calculations in paragraphs (7)-(13), if one were to push to and beyond the limits of the Bratescu et al. disclosure, the "ionic liquid" obtained would not come close to the claimed concentrations and, in fact, would not be an ionic liquid at all.

As attested in paragraph (11), even if the maximum amount of sulfosuccinate and the corresponding amount of quaternary ammonium would be used by one seeking to extend Bratescu et al. to the limits of its disclosure, the resulting solution would still contain only 24-31% of the so-called "ionic liquid", and would not be an ionic liquid as claimed. Thus, even if this would be considered similar to the claimed ionic liquid, the concentration is so different that the properties would be very different, and there is no simple way to modify (actually, to defy and proceed against) the teachings of Bratescu et al. to attain a higher concentration of the components corresponding to the claimed ionic liquid.

As attested in paragraph (12), the so-called "ionic liquid", prepared as in paragraphs (8)-(10), would be sparingly soluble, if at all, in the aqueous medium disclosed in the reference. Therefore, if these amounts of these ingredients were used, in order to obtain a solution, it would be necessary to have high amounts, even the maximum amounts, of the other surfactants present in order to solubilize the "ionic liquid" components contended by the Examiner to be within the scope of the Bratescu et al. teachings. If one added all of these surfactants, one would not have an ionic liquid.

As attested in paragraph (13), the composition formed according to the teachings of Bratescu et al. would not be an ionic liquid, it would not have the properties of an ionic liquid, and it could not be used as an ionic liquid.

As attested in paragraph (14), since Bratescu et al. clearly is concerned with the preparation of surfactant compositions for use as shampoos and body washes, there is nothing in the reference that would suggest the extreme modification of increasing the concentration of the quaternary ammonium and the auxiliary anionic surfactant to levels as high as 70 wt. %, as now claimed in the present application. To do so, one would have to defy the teachings of the reference, and destroy the purpose of the reference (see paragraph (16) in this regard). This cannot be a proper modification.

As attested in paragraph (15), since Bratescu et al. clearly is concerned with the preparation of surfactant compositions for use as shampoos and body washes, there is nothing in the reference that would motivate a person to try to use such a composition as an ionic liquid. The composition simply would not work as an ionic liquid.

As attested in paragraph (16), the disclosure of Bratescu et al., e.g., at col. 13, lines 25-65, makes clear that it is necessary to include not only the cationic and auxiliary anionic surfactants, but also the primary anionic surfactant and the bridging surfactant. The bridging surfactant is required so that all of the components remain in aqueous solution when the disclosed concentrate is diluted for use. This is quite different from the ionic liquids of the present invention. Modifying the disclosure of Bratescu et al. to obtain the concentration for it to be an ionic liquid would be contrary to the explicit teachings of Bratescu et al. and would destroy the purpose of the Bratescu et al. invention.

As attested in paragraph (17), as is known in the art, ionic liquids of the present invention are intended to be used with as little water as possible. The amount of water that is present is similar to an impurity, since all of the water is preferably removed from the ionic liquid. The whole purpose of using an ionic liquid is to avoid the drawbacks of conventional solvents, including both water and organic solvents.



For the additional reasons set forth in the Declaration of Roger D. Moulton, Applicants respectfully submit that the presently disclosed and claimed invention would not have been obvious over Bratescu et al., or over the prior art in general. Accordingly, Applicants respectfully submit that the claims are in condition for allowance and notice to such effect is requested.

### **Supplemental IDS**

Applicants submit herewith a supplemental IDS to submit various articles relating to ionic liquids. These references are submitted for background information, to show how ionic liquids are used and understood in the art. Appropriate review and consideration are respectfully requested.


### **Conclusion**

In the event issues arise as a result of the filing of this paper, or remain in the prosecution of this application, Applicants request that the Examiner telephone the undersigned attorney to expedite allowance of the application. Should an extension of time be necessary for the present Reply to the outstanding Office action to be timely filed, petition therefor is hereby made and, if any additional fees are required for the filing of this paper, the Commissioner is authorized to charge those fees to Deposit Account #18-0988, Docket No. SACHP0145US.

Respectfully submitted,

**RENNER, OTTO, BOISSELLE & SKLAR, L.L.P.**

Date: September 28, 2006

By   
Thomas W. Adams  
Reg. No. 35,047

1621 Euclid Avenue  
Nineteenth Floor  
Cleveland, Ohio 44115  
216/621-1113